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Student Motivation, Anxiety and Pass/Fail Grading: A SoTL Project

Patrick R. Walden
St. John's University, patrick@patrickwalden.com

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Student Motivation, Anxiety and Pass/Fail Grading: A SoTL Project

Abstract

This SoTL project explored sources of student anxiety and motivation across student assessment conditions of traditional numerical grading and pass/fail grading and sought to determine if pass/fail grading was helpful in lowering student anxiety while increasing student motivation to learn. Results indicated that students scored equally well on a test of student learning across pass/fail and numerical grading groups, indicating that pass/fail grading did not lead to poorer course objective mastery. Students were similar in terms of sources of anxiety and levels of anxiety. Motivation across groups was also similar, largely extrinsic in nature, and consistent pre- to post-course. Results coupled with subjective instructor reflection provide some, yet weak, support for the use of pass/fail grading in helping to ease course-related anxiety (at least for some) while still facilitating student development toward course learning goal mastery.

Keywords

SoTL, anxiety, pass/fail grading, specifications grading

“The Scholarship of Teaching of Learning (SoTL) involves faculty (sometimes in partnership with their students) undertaking systematic inquiry about student learning – informed by prior scholarship on teaching and learning – and going public with the results” (Center for Engaged Learning, Elon University, 2020). SoTL projects are undertaken when an instructor identifies a problem or issue in the classroom and actively seeks to explore evidence to address the issue or problem. This manuscript presents the results of an instructor-led SoTL project focused on the use of pass/fail grading to reduce student anxiety and increase student motivation to learn in a graduate speech-language pathology course.

Reports of increases in the prevalence of college student anxiety are now common and largely include academic distress as the major source of anxiety in this group (although financial, family and peer sources also contribute to college student anxiety; Jones et al., 2018). Anxiety has been reported to affect the student learning process in communication sciences and disorders (CSD) as well (Chan et al., 1994; Plexico et al., 2017; Sleight, 1985). Instructors may find student anxiety levels to interfere with learning in academic settings and look for ways to increase enjoyment in the learning process while decreasing course-related anxiety (Gibbons et al., 2018).

One instructional design avenue recently reported in the literature to help ameliorate CSD students’ course-related anxiety (Leslie & Lundblom, 2020) is specifications grading. Specifications grading (Nilson, 2015) is an approach that uses pass/fail grading for all assignments and directly links the eventual course grade to how well the students meet the course outcomes (similar to a competency-based approach to training; Walden, 2020). Scholarly writing on specifications grading has largely been in the form of formal descriptions of it (see Leslie & Lundblom, 2020 and Carlisle, 2020 for examples) or accounts of its implementation (see Blackstone & Oldmixon, 2019 for application to political science; Bonner, 2016 for application to counseling education; and Roberson, 2018 for application to computer science). As an overall approach to assessment, specifications grading has not been subjected to effectiveness studies. However, one of its key tenets, pass/fail grading, has a long history of scholarly discussion (Melrose, 2017) and has some empirical exploration of its effectiveness (Spring et al., 2011).

Spring et al. (2011) reviewed the existing literature on the effect of pass/fail grading on medical students’ psychological well-being. Of the four studies meeting their inclusion criteria, all reported an improvement in medical students’ psychological well-being as a result of pass/fail grading. For example, Bloodgood et al. (2009) explored medical students’ psychological well-being during the first two years of medical school while changing the grading system from a traditionally graded format to pass/fail grading. They reported that students in the pass/fail cohort reported lower anxiety, lower depression, increased positive well-being, increased self-control, increased vitality, and increased general health compared to the traditionally graded cohort. Similarly, Rohe et al. (2006) reported that medical students in a pass/fail group perceived less stress in their first two years of medical school compared to students who had received traditional grading. However, they did not find a difference between these groups for test anxiety. At the same time, other authors have reported that pass/fail grading lowers student anxiety (Robins et al., 1995).

Pass/fail grading has also been reported to increase students’ motivation to focus on learning rather than grades (White & Fantone, 2010). Human motivation has often been reduced to the idea that intrinsic motivation comes from within the person and extrinsic motivation serves as an external

reward for behavior (although this view has been negated, see Reiss, 2012). Ryan and Deci (2000) posited that extrinsic rewards may interfere with one's intrinsic motivation. As such, traditional grading has been suggested to foster extrinsic motivation in educational settings rather than intrinsic motivation (Chamberlin et al., 2018). Indeed, Ramaswamy et al. (2020) suggested that pass/fail grading is an avenue to increase student self-determination and foster a focus on competency achievement in dental education. From an empirical point of view, pass/fail grading's effect on students' academic motivation has yet to be explored. In fact, White and Fantone's (2010) study of medical students is the only study located that directly addressed students' intrinsic motivation as it related to pass/fail grading, however, it seems that a direct measure of students' sources of motivation was not included in their study.

Royal et al. (2020) explored veterinary student perspectives of traditional and pass/fail grading paradigms. They reported a split among the student informants, with the majority favoring traditional grading. In other words, receiving a grade, in and of itself, was perceived to increase motivation. Those who favored traditional grading reported that it increased their motivation to learn, and that pass/fail grading may lead some in the class to not take it as seriously. While not explicitly stated, it appears that the student perspective aligns with traditional grading of tests being an external motivator, suggesting that traditional grading may contribute to students' external loci of academic motivation.

Educational leaders who support traditional grading methods have posited that pass/fail grading will "dumb down" curricula (Wilkinson, 2011). However, pass-fail grading has been shown to lead to equivalent performance outcomes in medical education (Ange et al., 2018), suggesting that pass-fail grading could benefit students and faculty by lowering student anxiety and increasing metacognitive abilities and motivation to learn, all while maintaining rigor. Spring and colleagues (2011) reviewed the literature on pass/fail grading's impact on academic outcomes in medical education. They reported on six studies that specifically measured academic outcomes and found that five of them all reported no difference between pass-fail and traditional grading groups. The one study that did show a difference between groups was mixed (pass/fail group demonstrated higher outcomes in one course but lower than the traditionally graded group in two courses). Rohe et al. (2006) summarized the literature on student achievement and pass/fail grading by stating that, "... research analyzing academic achievement and grading systems suggest little, if any, harm from the pass-fail system..." (p.1444). These promises have yet to be tested in CSD.

As such, the purpose of this SoTL project was to explore sources of student anxiety and motivation across student assessment conditions of traditional numerical grading and pass/fail grading and to determine if pass/fail grading is helpful in lowering student anxiety while increasing student motivation to learn. A graduate level speech-language pathology course split into two sections, each using a different grading scheme, was used to conduct this project.

Project Questions

1. What course-related sources of anxiety did student participants report?
2. What, if any, were the differences in sources of reported course-related anxiety between a course section graded traditionally and one section that received pass/fail grading?
3. Did the students' reported level of anxiety change pre- and post-semester? If so, how so?
4. Did students' sources of motivation change over the course of the semester and, if so, how?

5. Was there a difference in students' summative assessment results between the traditionally graded section and the pass/fail graded section?

Methods

Instructional Context of CSD 308: Disorders of Voice, Resonance and Fluency and Student Participants. *CSD 308: Disorders of Voice, Resonance and Fluency* is a graduate course in the fourth of a five-semester Master of Arts program in Speech-Language Pathology at St. John's University in Queens, NY, USA. The university bulletin description of the course describes the course as covering, "Etiology, characteristics, assessment methods, and management techniques for disorders of voice, resonance, and fluency. Includes anatomy/physiology, normal development, biological, psychological, linguistic, acoustic bases of disorders."

The course structure included 17 course assignments, each tied to a course learning objective provided to the students in the syllabus. The course utilized a specifications grading structure (Nilson, 2015) in which students chose how many of the assignments they wanted to complete. To earn a top score in the course (i.e., "A"), all 17 course assignments had to receive a passing grade. For students who were satisfied earning lower grades, fewer assignments were required. The midterm and final exams assessed all learning objectives and were required for all students so that each course objective could be measured even when all 17 assignments were not completed. In this course format, students earn higher grades when they do "more" work or more "in-depth" work in the goal areas (or a combination of "more" and "in-depth") across the 17 possible assignments. If a student was aiming for a "C" grade, they only had to pass (80% criterion) both the midterm and the final exam. No student chose this grade as their goal. Students were allowed a total of four opportunities to redo assignments (four total across all assignments, not four for each assignment) so as not to prevent students from achieving their desired grade due to a few mistakes during the learning process and to increase the focus on *teaching* students and allowing some individualization in the learning process for those who need it. Four "redo" opportunities were chosen based on the instructor's experience only. There is no evidence base on which to base the number of "redo" opportunities allowed.

The course was offered in two sections taught by the same instructor. The sections were assigned a semester earlier during academic advisement and assignment was random (nothing about individual students dictated their section assignment). The course instructor was not involved in the student assignment to sections. One section (the numerical grading group), containing 29 female students between the ages of 20 and 25, received traditional, numerical grades (e.g., 82% on a term paper). Rubrics or expectations for all assignments were provided to the student and included how the grade would be calculated. The other section (the pass/fail group) was made up of 19 female students between the ages of 20 and 25. This section received grades of either "pass" or "fail." Rubrics or explicit explanations for all assignments were also made available to students in this section with the exception that grading explanations included what was required to receive a grade of "pass." Everything else was considered a "fail."

Both sections were taught by the same American Speech-Language-Hearing Association-certified, Ph.D.-level instructor with twenty years of combined research and clinical experience in the subject areas. The instructor had not previously taught any of the students in either section during

their graduate studies. The numerical group was instructed once a week during the Fall semester for a total of 14 two-hour sessions. The pass/fail group received instruction immediately following each numerical group session for the same duration and same 14 class sessions. The same teaching materials and course sequence were used for both sections. The only material difference between the two sections of the course was the way assignments were graded.

Procedures. The Institutional Review Board (IRB) at St. John's University reviewed the project's methods prior to its commencement and approved the protocol with exempt status. To address the SoTL project questions, formal measures of student anxiety, motivation, and subject knowledge were collected both pre-course (on the first day of class) and post-course (on the last day of class). An additional informal measure of sources of student anxiety was collected on the final day of class and this source of data is described in the measures section below. Except for the subject knowledge measures (pre- and post-course), the instructor did not know who completed the measure and who did not to avoid the appearance of coercion during the project. Not all students completed all measures resulting in uneven numbers across measures. Format for completion of measures was paper and pencil (again, except the subject knowledge measures).

Sources of Course-related Anxiety Measure. To address SoTL project question numbers 1 and 2, all students were asked, on the last day of their class (during class time), to "Describe your level of anxiety regarding the work required of you in this course at this time." Also, they were asked to respond to "What are your perceptions of the course design you participated in this semester? Did it help you meet the learning goals? Please explain whether your answer was 'yes' or 'no'." Data were in narrative format and were handwritten. Written answers to both questions were used to locate sources of course-related anxiety. Student comments on the overall course structure, if not related to course-related anxiety, were used for quality improvement and are not reported in this paper. The instructor remained in the classroom during administration, however, he worked on other tasks and did not attend to the students during completion of this task. A student volunteer picked up the written responses and placed them in a sealed envelope and provided them to the instructor.

Formal Measure of Anxiety. To measure student anxiety at the beginning and end of the semester (SoTL project question 3), the Overall Anxiety Severity and Impairment Scale (OASIS; Norman et al., 2006) was administered on the first day of the class and the last day. Students completed the brief, 5-item measure anonymously. The instructor did not know who completed the measure and who did not to avoid the appearance of coercion during the project. Not all students completed the measure. The OASIS has been shown to be valid and reliable with college students in "assessing the frequency and intensity of anxiety symptoms, the functional impairment related to these anxiety symptoms, as well as behavioral avoidance across anxiety disorders or for subsyndromal anxiety" (Norman et al., 2011, p. 3). The measure requires the user to rate themselves across five questions and the ratings are summed, creating an overall score between 0 and 20. Norman and colleagues (2011) also reported that a cutoff score of >8 is problematic and would require referral to a mental health professional. For the OASIS, Norman et al., (2006) reported good internal consistency (Cronbach's alpha was .80). Convergent validity was reported as excellent with other published anxiety measures (ranging from $r=.51$ to $.62$). One month test-retest reliability was reported as strong (test-retest reliability coefficient =.82).

Formal Measure of Motivation. The Academic Motivation Scale (AMS C-28; Vallerand et al., 1992) was used to measure student self-reported sources of motivation (SoTL project question 4). The AMS C-28 is a questionnaire-based instrument designed to assess levels of intrinsic, extrinsic, and amotivation. Research has shown that it has good validity and reliability (Cokley et al., 2001; Vallerand et al., 1992). Cokley et al., (2001) reported the AMS C-28's seven-factor structure was adequate (Chi-square/df ratio = 2.1, standard root mean square residual = .08, and root mean square error of approximation = .07). Reliability was demonstrated with Cronbach's coefficients ranging from .70 to .86 across the subtests.

Results of the AMS C-28 include a score for three sources of intrinsic motivation, three sources of extrinsic motivation as well as a score for amotivation. Intrinsic motivation scores include motivations "to know" something, motivations toward "accomplishment," and motivation to engage in an activity for pure emotional and intellectual "stimulation." Extrinsic motivation scores include external motivations that "regulate" behavior, such as rewards, as well as when those external motivators become "introjected" or internalized (e.g., engaging in an activity because one is supposed to), and when the individual starts to "identify" with the introjection. One score for "amotivation" demonstrates the extent to which the individual does not see one's actions as having a relationship with a desired outcome, hence lacking either internal or external motivation.

Student Learning Assessment. To address the last SoTL project question, students completed an instructor-designed, multiple-choice pre-test. The same pre-test was broken up by topic and served as the midterm and final exam for the course. The pre-test was an 120-item exam covering fluency disorders, voice disorders, and resonance disorders due to cleft lip and palate. All questions were written at Bloom's Taxonomy level of "application" (Bloom, 1956); that is, each question required students to apply knowledge rather than simply recall it. Exam items included 10 questions on etiology, 10 on characteristics, 10 on assessment and 10 on treatment/management for each topic: fluency disorders, voice disorders, and resonance disorders, for a total of 120 questions. In reporting post-test results, the midterm and final exams were combined to match the pre-test that contained all items. Each question was awarded 10 points (although this was completely arbitrary and could easily have been one point per question). The pre-test and post-tests (midterm and final exams) were administered via a learning management system (LMS; thus the random assignment of 10 points per question- the LMS determined this and the instructor did not change it). All students completed these measures.

Analyses. Data for SoTL project questions 1 and 2 (course-related sources of anxiety and differences between sections) were written narratives from participant students. The author reviewed the narratives and listed sources of course-related anxiety the participants reported. The author was not blinded to the groups during analysis. These sources of anxiety were tallied across all participants and graphed. Differences in sources of course-related anxiety based on the grading group were evaluated through visual inspection of the graphs created by the data. No inferential statistics were required to address these two SoTL project questions.

Between-group comparisons for level of anxiety (OASIS scores; SoTL project question 3) were analyzed for pre- and post-course administrations of the instrument using an *independent samples t-test* with an alpha level of $p < .05$. Within-group comparisons between pre- and post-course levels

of anxiety were accomplished by performing a two-tailed *analysis of variance (ANOVA)* with an alpha level of $p < .05$ using the scores from the OASIS instrument.

Change in participant reported sources of motivation (SoTL project question 4) was determined through use of a *repeated measures ANOVA* with an alpha level of $p < .05$ across the AMS C-28 subscale values. SoTL question 5 (summative assessment results) were compared between grading groups using an *independent samples t-test* with an alpha level of $p < .05$.

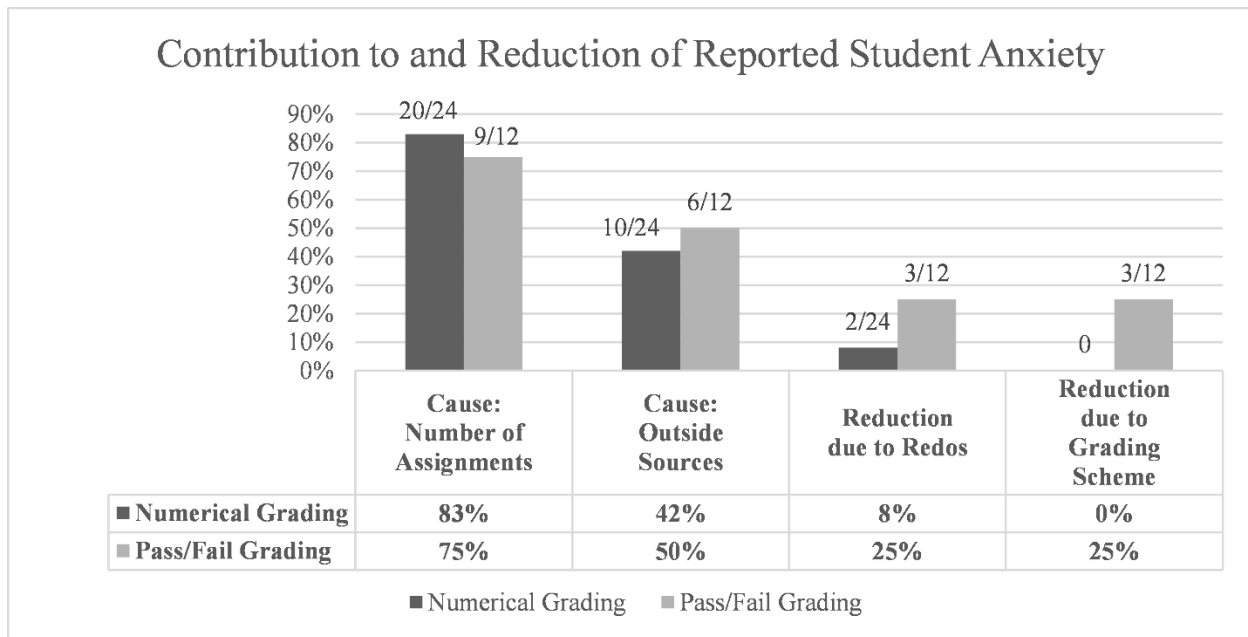
Student summative assessment results (SoTL project question 5) were compared pre- and post-course between groups using *independent samples t-test* with an alpha level of $p < .05$. Each question on the tests was worth 10 points and there were a total of 120 questions.

Results

Course-related Sources of Anxiety and Differences between Groups. Both the numerical and the pass/fail grading groups reported similar sources of anxiety. The largest (and only) source of course-related anxiety was the number of assignments in the course for both groups. Both groups also reported sources of anxiety from outside the course itself (such as externship placements or family issues). These “outside” sources of anxiety were collapsed together because they were not sources of anxiety an academic course could address. Two students in the numerical group and three in the pass/fail group mentioned that that ability to redo assignments reduced anxiety. No students in the numerical group and three in the pass/fail group mentioned that the grading format reduced course-related anxiety. Figure 1 depicts these findings for both groups.

Students’ Overall Reported Anxiety. Mean total score on the Overall Anxiety Severity and Impairment Scale (OASIS) at the beginning of the course was 5.179 for the numerical group (28 students responded) and 6.444 for the pass/fail group (18 students responded). Both the Shapiro-Wilk Test of Normality and Levene’s Test were not significant, allowing for use of a *t-test*. These scores were not significantly different between the groups ($t = 1.204$, $df = 44$, $p = .235$). Mean total score on the OASIS at the end of the course was 7.6 for the numerical group (25 students responded) and 8.2 for the pass/fail group (10 students responded). Both the Shapiro-Wilk Test of Normality and Levene’s Test were not significant, allowing for use of a *t-test*. These scores were not significantly different between the groups ($t = 0.348$, $df = 33$, $p = .730$).

Numerical group. An Analysis of Variance explored differences in OASIS scores pre-test to post-test for the numerical group. Levene’s Test was significant for this group, so a Brown-Forsythe correction was applied to the ANOVA. Mean pre-test score was 5.179 (28 students completing), increasing to 7.6 post-test (25 students responding). The difference was statistically significant ($F = 4.425$, $p = .041$, $\eta^2 = 0.083$). The effect size of this difference, measured by η^2 , was very small.

Figure 1*Contribution to and Reduction of Reported Student Anxiety*

Pass/Fail group. An Analysis of Variance also explored differences in OASIS scores pre-test to post-test for the pass/fail group. Levene's Test was not significant for this group, so no correction was applied to the ANOVA. Mean pre-test score was 6.444 (18 students completing), increasing to 8.2 post-test (10 students responding). The difference was not statistically significant ($F = 1.370$, $p = .252$).

Students' Reported Motivation. Table 1 illustrates students' Academic Motivation Scale (AMS C-28) subtest scores by student group and test time (pre- or post-course).

Inspection of Table 1 shows that groups were comparable to one another both pre-course and post-course in terms of sources of motivation measured by the AMS C-28, except for one within group difference for "Amotivation." Independent Samples t-tests revealed no statistically significant differences between the numerical grading and the pass/fail grading groups on any of the subtests pre- or post-course. A repeated measures ANOVA found that the "Amotivation" score for the pass/fail group was statistically different from pre-course to post-course ($F = 5.931$, $p = .02$, $\eta^2 = 0.082$). The effect size of this difference, measured by η^2 , was very small. Both groups' highest score pre- and post-course indicated external motivation as being the predominant motivator (i.e., Extrinsic- Identified category). The second highest motivator was reported to also be extrinsic in nature (Extrinsic- Regulation category).

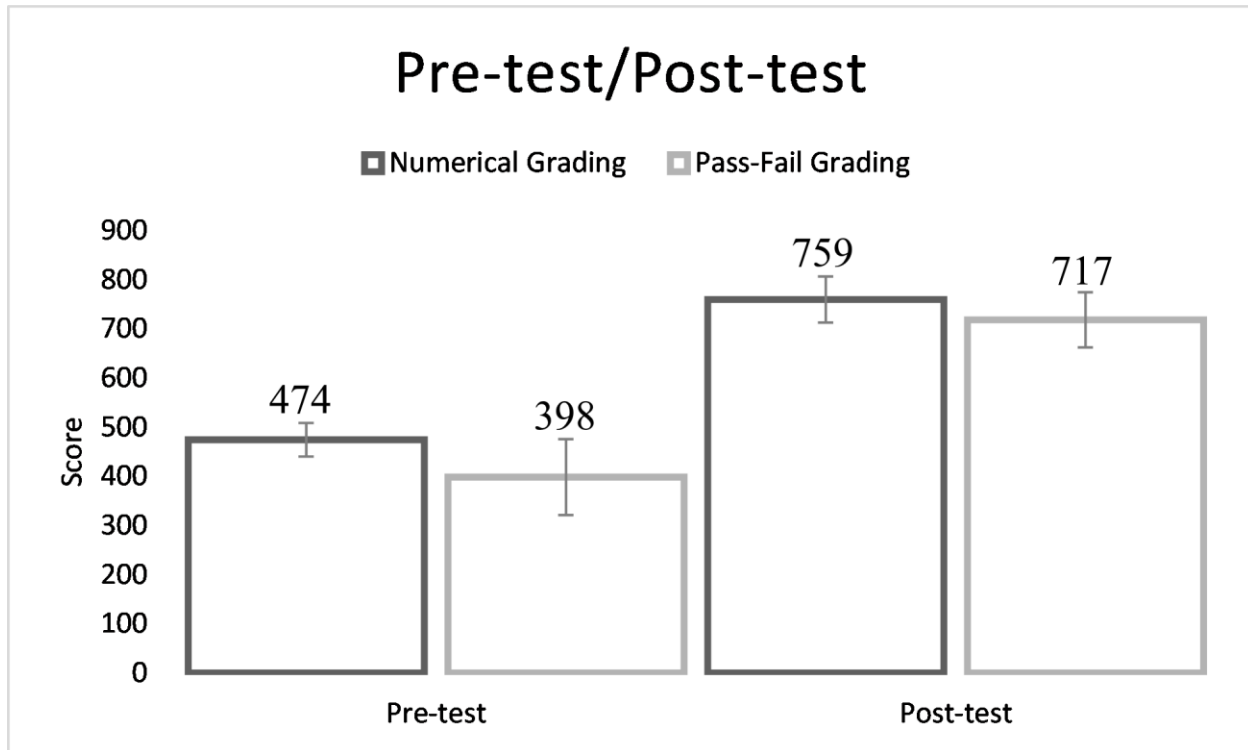
Table 1*AMS Subscale Scores*

	Before Course		After Course	
	Numerical Group	Pass/Fail Group	Numerical Group	Pass/Fail Group
Intrinsic- To Know	5.51	5.29	5.18	5.52
Intrinsic- Accomplishment	4.88	5.32	4.90	4.97
Intrinsic Stimulation	3.45	3.70	3.37	3.70
Extrinsic- Identified	6.32	6.09	6.18	6.33
Extrinsic- Introjected	5.34	4.90	5.01	4.85
Extrinsic Regulation	6.11	5.80	6.16	5.78
Amotivation*	1.10	1.18	1.27	1.40

Note: *Denotes a statistically different difference between the "Before Course" administration and the "After Course" administration within the Pass/Fail group ($p < .05$).

Students' Summative Assessment Results. *t*-tests were used to explore differences between groups for pre-test and post-test scores. Neither was statistically significant (Pre-test: Numerical $M = 474$, $SD = 68$; Pass-Fail $M = 398$, $SD = 153$; $t = 2.02$, $df = 23$; $p = 0.056$; Post-test: Numerical $M = 759$, $SD = 94$; Pass-Fail $M = 717$, $SD = 112$; $t = 1.33$, $df = 34$; $p = 0.19$). These results are depicted in Figure 2.

Instructor Reflections on Grading Schemes. In considering the purpose of this SoTL project, data regarding student learning achievement as well as their perceptions on their motivation and sources and level of anxiety were included. However, consideration of pass/fail grading would be incomplete without the instructor's subjective point-of-view. As the instructor, I found the use of specifications grading to be helpful in attempting to change my (and the students') focus from task- and grade-based to a more mastery of stated course goals focus. This was based on my personal thought processes during both planning and facilitating the course. My grading tasks across the two sections were quite different. Deciding whether a student's work was adequate (met the goals/requirements of the assignment) or not adequate (did not meet the goals/requirements) was a quick and, often, easy task. Deciding "how" adequate or "how" not adequate that work was required extra consideration (i.e., assigning a numerical grade). Removing the need to always describe "how" adequate or not adequate work was, freed up time for me to provide other feedback. It also eliminated "grade grubbing" where students "aggressively barter" for any extra point possible.

Figure 2*Summative Assessment Group Comparisons Pre- and Post-Course*

Use of pass/fail criteria for all assignments allowed me, as the instructor, to really think about and express what exactly “good enough” looked like, for me and the students. For example, I could stop counting grammar errors and determining whether they were egregious enough to warrant five points off on a paper. Instead, I could simply tell the student that there were several grammar errors that needed attending and asked the student to redo the assignment and fix this. If the first shot at an assignment was not adequate (does not matter how inadequate), the redo was almost always adequate. It did not matter for me (or the student) that it was -10 points inadequate. The only important concept was that the learning goal was not met and needed to be revisited. This, thus, saved time in grading assignments while still facilitating student development. Overall, I, personally, appreciated the pass/fail format and have begun using it in all my classes.

Discussion

In summary, the results indicated that the number of assignments was the only course-related source of anxiety reported. A small number of students reported that pass/fail grading reduced their course related anxiety. The numerical grading group’s OASIS scores (anxiety measure) were statistically higher post-course than pre-course, although the effect size was very small (indicating likely little “clinical” significance). This pre- to post-test difference was not seen in the pass/fail group. Regardless of pre- and post-test differences in anxiety (OASIS scores), no scores indicated clinically significant anxiety. For motivation, the two groups were similar across all subcategories both pre- and post-course with the exception of the amotivation subcategory. For amotivation, the

pass/fail group showed a statistically significant difference pre-course to post-course. This was not observed in the numerical group. Assessment of knowledge showed that both groups were comparable (not different) both pre- and post-course.

It appears that students in both sections experienced the same source of course-related anxiety, regardless of grading method employed. The large number of assignments was the only source of anxiety reported that fell within the confines of an academic course. Seventeen assignments for one course is a large number despite students having the option to not do all of them and still receive a passing grade. Many of the assignments were also less time-consuming in nature than larger projects (e.g., one-page paper comparing two treatment approaches). Nevertheless, the number of assignments seemed to be a cause for student anxiety in this course and should be re-evaluated in terms of cost (anxiety provoking) versus benefit (demonstration of learning in all course goal areas) to the student.

At the same time, at least for three students, it seemed that pass-fail grading may have lessened course-related anxiety. Similarly, the ability to redo assignments was also reported to be helpful in terms of reducing anxiety for five of the students. The students' overall levels of anxiety as measured by the OASIS were comparable across groups pre- and post-course. However, the level of anxiety increased significantly from pre- to post-course for the numerical grading group but not for the pass/fail group. This could be, and likely was, a result of the uneven numbers of participants who completed the instrument across the groups. The numerical group started out larger than the pass/fail group by virtue of course assignments at the university. However, fewer students completed the OASIS at the end of the course, and those who did may have been in some way different than those who did not. It would be inappropriate to claim grading scheme causation for level of anxiety in this instance. However, it is logical that students experience more anxiety at the end of a term when multiple projects/assignments/clinical placements must be completed to end the semester. Also of note was that the levels of anxiety reported were all below what would have required professional evaluation (cutoff score of >8 ; Norman et al., 2011).

The student participants reported that they were predominantly motivated by extrinsic sources. This is in line with previous research on graduate students (Hegarty, 2010; King & Chleboun, 2019). The sources of external motivation remained consistent for both groups pre- and post-course. It appears that the grading format of a course does not necessarily change students' academic motivation. It is, however, possible that it reinforces the external source of motivation for many students. In this case, getting the "pass" grade or the "90%" grade may be the student's major source of motivation and this continues regardless of whether it consists of a number indicating achievement (numerical grade) or a concept that signifies accomplishment (pass/fail).

In terms of intrinsic motivation, each of the three areas measured ("To Know," "Accomplishment," and "Stimulation") remained similar pre- to post-course for both groups. It seems that the pass/fail grading format in this one class did not seem to affect the students' levels of intrinsic motivation. Intrinsic motivation, however, is precisely the type of motivation pass/fail grading is purported to facilitate (White & Fantone, 2010).

The reported level of "amotivation" was significantly higher for the pass/fail group post-course. It is highly unlikely that a pass/fail grading scheme would increase a student's sense that their effort

is not tied to a desired outcome when the sources of motivation (external and internal) remain consistent. Although the difference between pre- and post-group amotivation for the pass/fail group was likely not to have occurred due to chance, the η^2 of 0.082 (effect size) was tiny, meaning the measured change was unlikely to be of practical significance. Further, research on amotivation in educational settings, while limited, seems to indicate that less “controlling” styles of classroom management lead to greater intrinsic motivation and less amotivation. For example, Leyton-Román et al. (2020) found that “controlling” teacher behaviors, like judging and devaluing, reinforce amotivation in school-aged children. While it is unclear if this applies to adult students, the course format and pass/fail grading criteria were designed to increase student autonomy, rather than impose more control over the student. The increased amotivation observed in this study, despite its lack of practical significance, does not align with this view of amotivation and course design.

Also, research in middle school-aged children suggests that amotivation is significantly associated with poorer academic achievement (Leroy & Bressoux, 2016). Again, the increased amotivation observed in this study does not demonstrate the same relationship, as both groups showed comparable performance on the summative assessment. Graciani-Hidajat and colleagues (2020), in a rare look at amotivation in college students, reported a link between decreases in amotivation and solid social supports from peers, families, and instructors. They reported that social support was found, in their study, to be the “dominant factor influencing motivation” (p. 130). Social support was not considered in planning this SoTL project, but it is possible that some level of social support differed between the groups. Further, the change in amotivation from pre- to post-course for the pass/fail group may be the result of fewer students in the pass/fail group completing the AMS C-28 instrument post-course, making comparison from pre- to post-group much more difficult.

Student demonstration of learning of course concepts through testing showed that there was no difference between the groups in academic achievement post-course. This suggests that pass/fail grading may be implemented without negatively affecting student learning. Instructor perceptions of pass/fail grading included saving time as well as being able to focus on student demonstration of competence rather than assigning a numerical grade. Three students reported that pass/fail grading reduced their course-related anxiety. While this is a low number of students, pass/fail grading was helpful for decreasing course-related anxiety for at least some of the students. Whether pass/fail grading is an effective option for educators to help lower academic anxiety for large groups of students requires more exploration.

Limitations and Future Directions

This study was conducted in an actual graduate course. In field research, it is not possible to tightly control variables as in laboratory-based studies. Every effort was made to make the two sections of the course identical in terms of instructor, topics covered, and assignments. It is, however, possible that differences in class discussions or the pace at which topics were covered between the sections could have colored the students’ perceptions of sources of anxiety. It is also possible that the difference in class time (pass/fail section was later in the evening) could have led to student fatigue and somehow affected the findings. Further, anonymous administration of many of the SoTL project’s measures resulted in uneven numbers between pre- and post-course as well as

across grading groups. This may have affected the results of statistical analysis such that changes in sources and levels of anxiety may have been noted with a larger and more consistent number of respondents.

In addition, the construct of social support was not included in the planning of the SoTL project but has been shown to affect academic motivation (Graciani Hidajat et al., 2020). Future studies should include aspects of social support as a means to understand student academic motivation. Although the individual instructor has no control over aspects of familial social support, in-class or in-program peer and instructor social supports could be of interest. Last, the experiences of the student participants reported in this manuscript may vary from other CSD students, limiting generalizability. However, findings for anxiety-related variables as well as motivation are consistent with previous research which lend some strength to both validity and reliability of the data reported here, despite its single context nature.

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